REMARKS/ARGUMENTS

Claim Status

Claims 1, 3-7 and 9-11 are pending. Claim 1 is currently amended. Claims 10 and 11 are added. Amended claim 1 finds support as follows: (i) "white-light" on page 10, lines 20-26 of the specification; (ii) "to thereby allow an electrical conduction to the light emitting device from the rear surface to the front surface without using a wire-bonding" on page 6, lines 11-19, page 14, lines 13-21, and page 17, lines 3-11 of the specification; and (iii) "thickness of 1 to 5 μm" from previously presented claim 8 and page 6, lines 6-8 of the specification. New claim 10 finds support in the specification: "applicable maximum current quantity" of Examples 1-24 of Table 1 in page 12. New claim 11 finds support in the specification: page 10, lines 20-26. No new matter has been entered.

§112, first paragraph, Rejection

Claims 1 and 3-9 are rejected as failing to comply with the written description requirement because "[t]here is no support in the specification for the claim limitations of 'the light emitting device comprises a vapor-deposited metal film and via holes' as recited in claim 1" (Office Action, page 2, item 3). Applicants respectfully traverse this rejection.

Contrary to the Office's position of lack of support, Applicants point out that support for such limitations can be found in numerous locations throughout the specification. For example, pages 4, 5, 6, 9 and 11, as well as Figures 1 and 2. It should also be noted that said support not only discloses such limitations but also describes the function, composition and possible creation methods of such parameters. Accordingly, these limitations are disclosed in such a way as to reasonably convey to one skilled in the art that the inventors were in possession of the claimed invention at the time of filing. Thus, Applicants request withdrawal of this rejection.

§103(a) Rejections

Claims 1, 4, 5, 8 and 9 are rejected as obvious in view of *Lee* (US 2004/0262738) and *Hikasa* (US 5,770,821). Claim 3 is rejected as obvious in view of *Lee*, *Hikasa* and *Nakabayashi* (US 2002/0167017). Claims 6 and 7 are rejected as obvious in view of *Lee*, *Hikasa* and *Arai* (US 4,220,810). Applicants respectfully traverse these rejections.

The claimed invention relates to an apparatus that emits white light, wherein the apparatus has a particular structure such that the reflection efficiency of the emitted white light is improved by controlling (i) the surface roughness of the co-fired aluminum nitride substrate, (ii) the materials that make up the vapor-deposited film (i.e., Ag or Al), and (iii) the thickness of the vapor-deposited film. Furthermore, the claimed apparatus "eliminates the necessity of connection of interconnections on the front surface of the substrate by a wire bonding process, simplifies the interconnection structure, avoids the protrusion of bonding wires in a thickness direction of the light emitting apparatus, and the light emitting apparatus can thereby be reduced in thickness and size," all of which results in drastic reductions of manufacturing costs (specification: page 6, lines 15-19).

Lee discloses a light emitting apparatus with the exception of the claimed surface roughness and the fact that the aluminum nitride substrate is co-fired. To address the deficiencies of *Lee*, the Office relies on *Hikasa's* disclosure of a semiconductor device comprising a co-fired aluminum nitride substrate (col. 3, lines 37-38; col. 5, lines 4-8) having a "mirror-like finishing (surface roughness Ra: 0.02 μm)" (col. 8, lines 52-54). Accordingly, the Office concludes that "[i]t would have been obvious to ... include the mirror-polished co-fired aluminum nitride substrate with a surface roughness of 0.3 μm Ra or less, as taught by *Hikasa et al.*, in *Lee et al.'s* device, in order to improve the thermal conductivity and the mechanical strength of the device" (Office Action, page 4).

In contrast to *Lee* and *Hikasa*, Applicants' apparatus has the claimed characteristics of (a) emitting white-light and (b) eliminating the necessity of connection of interconnections on the front surface of the substrate by a wire bonding process (this list is not exhaustive of the claimed characteristics). *Lee* and *Hikasa* are both silent with respect to (a) emission of white light, and therefore do not disclose or suggest such a feature as claimed by Applicants. Furthermore, not only are *Lee* and *Hikasa* silent about the particular emission of white light, but by default *Lee* and *Hikasa's* silence renders non-obvious the following determinations to obtain the claimed apparatus: (1) the desired surface roughness of the aluminum nitride substrate for increasing the emission intensity of the white light, (2) the desired material that makes up the vapor-deposited metal film for effectively reflecting the white light toward the front side of the substrate, and (3) the desired thickness of the vapor-deposited metal film for effectively increasing the luminous efficiency of the white light.

With respect to (b), Applicants note that *Lee* uses wire bonding, as evidenced by the figures and "bonding wire 254"; therefore *Lee* does not disclose or suggest Applicants' claimed apparatus that eliminates the wire bonding process. It should be noted that the claims have been amended to exclude the presence of wire bonding.

Accordingly, as neither *Lee* nor *Hikasa*, alone or in combination, disclose or suggest all of the claimed features of Applicants white-light emitting apparatus as discussed above, these references do not render obvious Applicants' claims. Thus, Applicants request withdrawal of the obviousness rejections of record.

Conclusion

Applicants submit that all now-pending claims are in condition for allowance. Applicants respectfully request the withdrawal of the rejections and passage of this case to issue.

Respectfully submitted,

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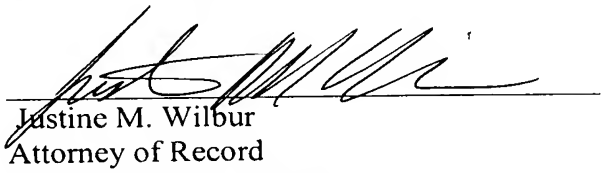

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